N-Channel 100-V (D-S) 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
100	0.016 @ V_{GS} = 10 V	60
	0.018 @ V_{GS} = 4.5 V	56

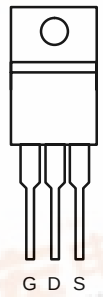
FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- PWM Optimized

APPLICATIONS

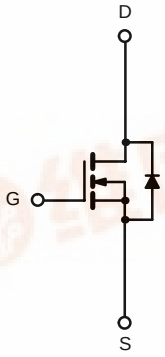
- DC/DC Primary Side Switch

TO-220AB



DRAIN connected to TAB

Top View
SUP60N10-16L



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 175°C)	T_C = 25°C	I_D	60	A
	T_C = 125°C		35	
Pulsed Drain Current		I_{DM}	100	
Avalanche Current		I_{AR}	40	
Repetitive Avalanche Energy[a]	L = 0.1 mH	E_{AR}	80	mJ
Maximum Power Dissipation[a]	T_C = 25°C	P_D	150[b]	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Junction-to-Ambient (Free Air)	R_{thJA}	62.5	°C/W
Junction-to-Case	R_{thJC}	1.0	

Notes
a. Duty cycle ≤ 1%.
b. See SOA curve for voltage derating.
c. When mounted on 1" square PCB (FR-4 material).

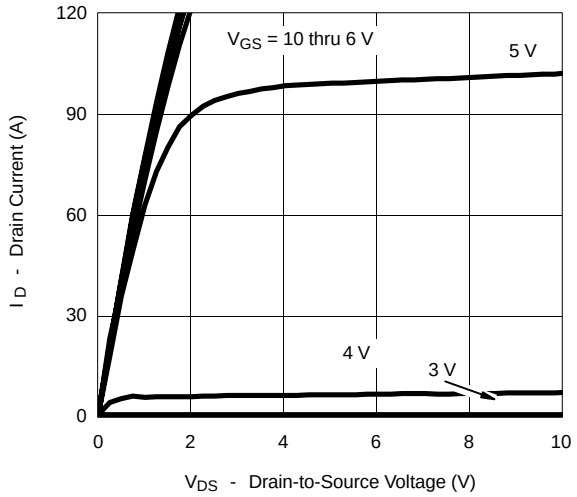
SPECIFICATIONS (T_J =25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 µA	100			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1		3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80 V, V_{GS} = 0 V			1	µA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 125°C			50	
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 175°C			250	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	100			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 30 A		0.0125	0.016	Ω
		V_{GS} = 4.5 V, I_D = 20 A		0.014	0.018	
		V_{GS} = 10 V, I_D = 30 A, T_J = 125°C			0.030	
		V_{GS} = 10 V, I_D = 30 A, T_J = 175°C			0.040	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 30 A	25			S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		3820		pF
Output Capacitance	C_{oss}			450		
Reverse Transfer Capacitance	C_{rss}			210		
Total Gate Charge[c]	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 60 A		73	110	nC
Gate-Source Charge[c]	Q_{gs}			15		
Gate-Drain Charge[c]	Q_{gd}			20		
Gate Resistance	R_G			1.5		Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 50 V, R_L = 0.83 Ω I_D ≅ 60 A, V_{GEN} = 10 V, R_G = 2.5 Ω		12	25	ns
Rise Time[c]	t_r			90	135	
Turn-Off Delay Time[c]	$t_{d(off)}$			55	85	
Fall Time[c]	t_f			130	195	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)[b]						
Continuous Current	I_S				60	A
Pulsed Current	I_{SM}				100	
Forward Voltage[a]	V_{SD}	I_F = 60 A, V_{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t_{rr}	I_F = 50 A, di/dt = 100 A/µs		62	100	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			3.1	5	A
Reverse Recovery Charge	Q_{rr}			0.10	0.25	µC

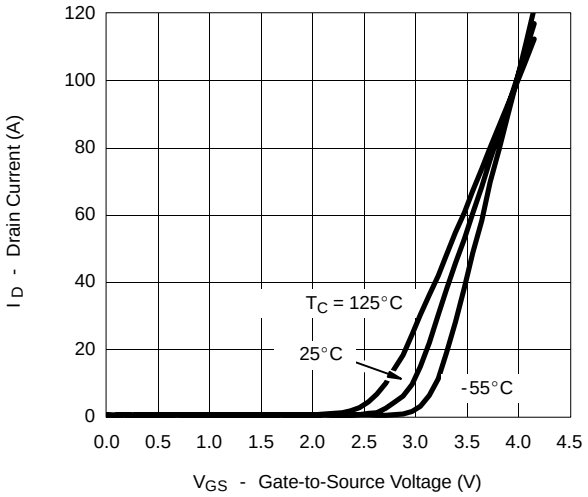
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

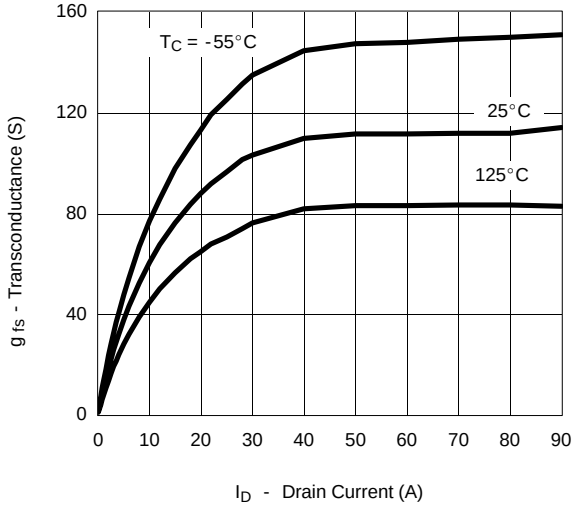
Output Characteristics



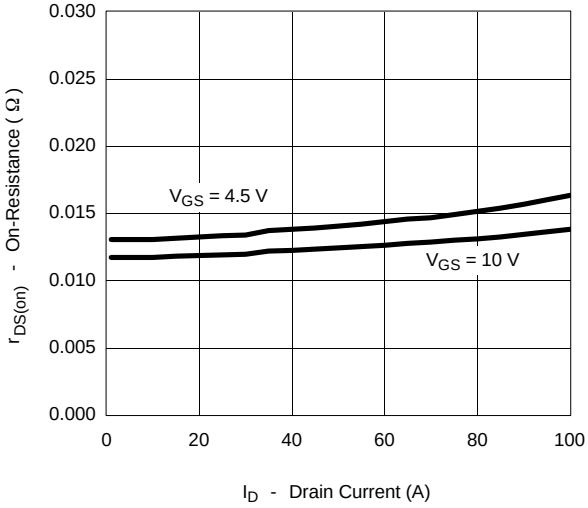
Transfer Characteristics



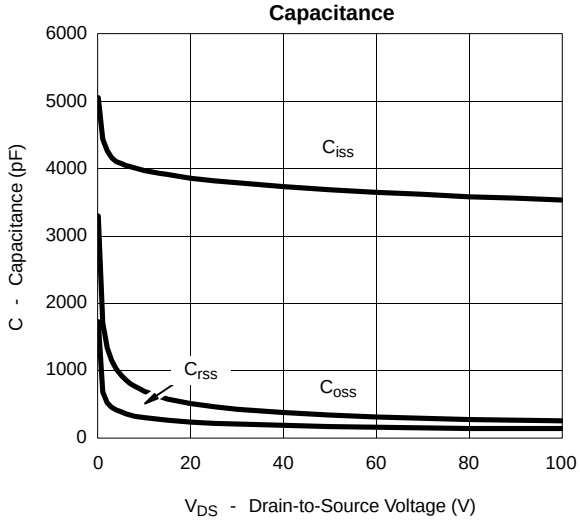
Transconductance



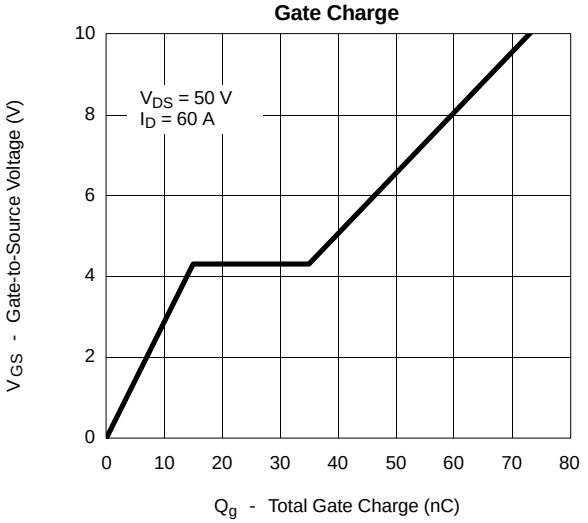
On-Resistance vs. Drain Current



Capacitance

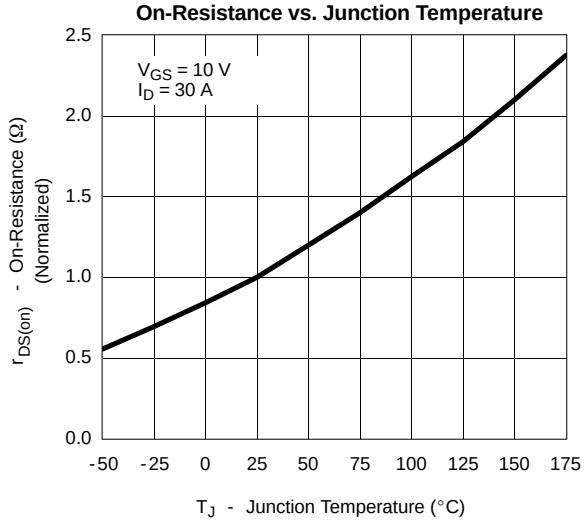


Gate Charge

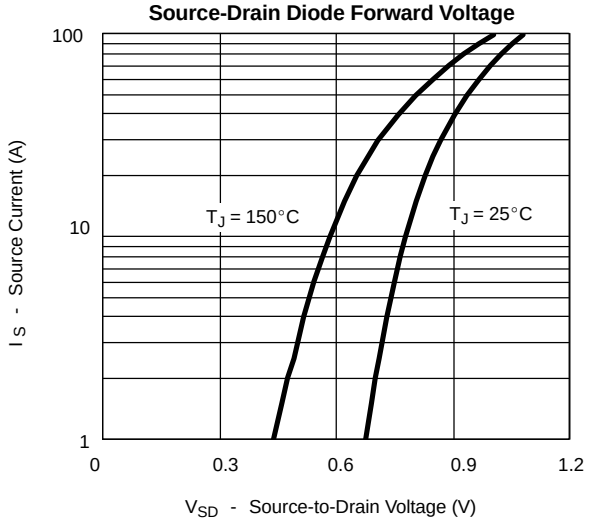


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

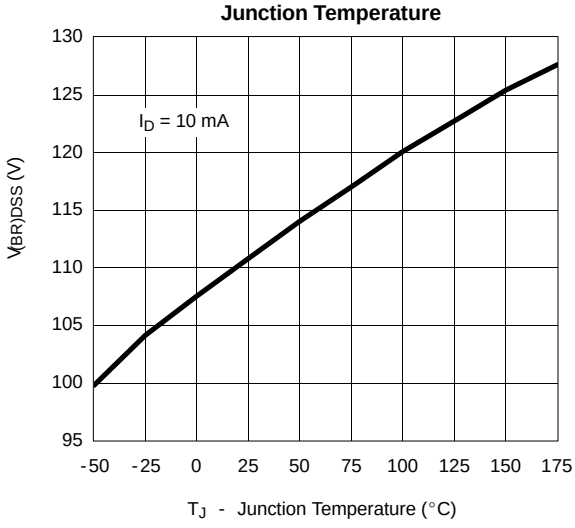
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

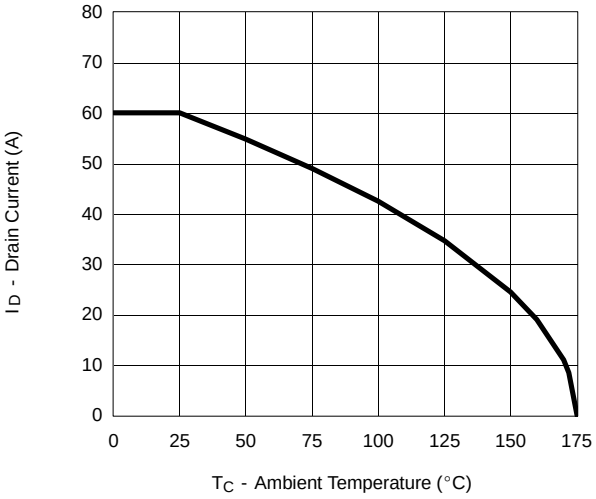


Drain Source Breakdown vs. Junction Temperature

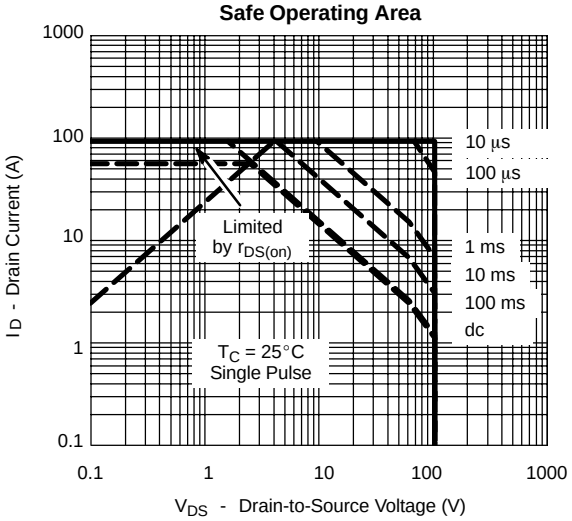


THERMAL RATINGS

Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case